

Amendments to the Claims

Claim 1 (Original): A membrane interface probe apparatus comprising:
a membrane interface probe (MIP) sensor having a larger diameter than a conventional MIP sensor.

Claim 2 (Original): The MIP apparatus according to claim 1 wherein said larger diameter MIP sensor is adapted for direct coupling to larger diameter rod systems.

Claim 3 (Original): The MIP apparatus according to claim 1 wherein said larger diameter MIP sensor allows use of said MIP sensor with larger capacity push and hammer systems.

Claim 4 (Original): The MIP apparatus according to claim 1 wherein said larger diameter MIP sensor allows use in situations where a low sidewall support of the drive rod string exists.

Claim 5 (Original): The MIP apparatus according to claim 1, wherein said larger diameter MIP sensor is adapted to include two or more permeable membranes.

Claim 6 (Original): A membrane interface probe apparatus comprising:
a membrane interface probe (MIP) sensor having two or more permeable membranes.

Claim 7 (Original): The MIP sensor of claim 6, wherein said two or more permeable membranes are arranged equidistant about a circumference of said MIP sensor.

Claim 8 (Original): The MIP sensor of claim 7, wherein said MIP sensor is operative to improve circumferential sensing and to increase likelihood of collection of volatile organic mass by said MIP sensor.

Claim 9 (Original): A membrane interface probe apparatus comprising:

a membrane interface probe (MIP) sensor adapted to improve watertight integrity by including undersea cabling electrical couplings and O-ring mechanical couplings.

Claim 10 (Original): A modular membrane interface probe (MIP) apparatus comprising:

a modular membrane interface probe (MIP) sensor constructed from a plurality of modular components allowing field serviceable replacement of any malfunctioning components of said plurality of modular components.

Claim 11 (Original): The modular MIP apparatus according to claim 10, comprising at least one of:

an external barrel having a cavity; and

an inner core barrel assembly field-insertable into said cavity having a heater cavity, wherein said heater cavity is adapted to receive a field-insertable removable cartridge heating element.

Claim 12 (Original): The modular MIP of claim 10, wherein said modular MIP apparatus comprises a removable conductivity nose assembly.

Claim 13 (Original): The modular MIP of claim 10, wherein said modular MIP apparatus comprises a field-insertable removable cartridge heating element.

Claim 14 (Original): The modular MIP of claim 10, wherein said modular MIP apparatus comprises at least one of a waterproof electrical connector and an O-ring seal.

Claim 15 (Original): A membrane interface probe apparatus comprising:

a membrane interface probe (MIP) sensor comprising a removable trap directly into the probe for the collection and concentration of volatile organic compounds.

Claim 16 (Original): The MIP apparatus according to claim 15, wherein said removable trap enables detection of lower levels of concentration of said volatile organic compound, and specific identification of compounds through post run chromatographic analysis.

Claim 17 (Original): The MIP apparatus according to claim 15, further comprising:
providing for calibration of said MIP sensor using chromatographic methods.

Claim 18 (Original): The MIP apparatus according to claim 15, further comprising means for simultaneous trapping and concentrating of volatile organic compounds during MIP sampling and logging events.

Claim 19 (Original): A membrane interface probe apparatus comprising:

a membrane interface probe (MIP) sensor comprising a heated transfer line from a body of said MIP sensor to a surface detector suite minimizing loss of volatile organic compounds in a cold transfer line.

Claim 20 (Original): A membrane interface probe apparatus comprising:

a membrane interface probe (MIP) sensor comprising an enhanced scanning solutions module, and a sample introduction system adapted to reduce overall equipment footprint and cost; to introduce calibration gases; and to allow for simultaneous sampling of volatile organic gas stream for immediate chromatographic analysis.

Claim 21 (Original): A membrane interface probe apparatus comprising:

a membrane interface probe (MIP) sensor comprising a global positioning system (GPS) receiver integrated with a data acquisition system adapted to allow simultaneous geo-referencing of sampling points with sample data.

Claim 22 (Original): A membrane interface probe system comprising:

a membrane interface probe (MIP) sensor comprising a mobile device in wireless communication with a data acquisition system enabling near real-time transfer of data from said MIP sensor to a base station.

Claim 23 (Original): The MIP system of claim 22, wherein said mobile device comprises a graphical display and control module adapted to operate said data acquisition system operation.

Claim 24 (Original): The MIP system of claim 22, wherein said mobile device is portable.

Claim 25 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module of claim 20,~~ wherein the enhanced scanning solutions module comprising: further comprises:

- a flow control subsystem;
- a detector subsystem coupled to said flow control subsystem;
- a dryer/moisture separator subsystem coupled to said flow control subsystem;
- a sampling subsystem coupled to said flow control subsystem; and
- a software control subsystem coupled to at least one of said flow control subsystem, said detector subsystem, said dryer/moisture separator subsystem, and said sampling subsystem.

Claim 26 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module of claim 25,~~ wherein said sampling subsystem of the enhanced solutions module comprises at least one of:

- a sample loop;
- an absorbent trap; and
- a gas chromatography injection port.

Claim 27 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module of claim 25,~~ wherein the enhanced scanning solutions module further comprising: comprises at least one of:

- an exhaust;
- a pneumatic supply;
- a power supply;
- a bypass module;
- a feedback signal; and
- a pressure control subsystem.

Claim 28 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module~~ of claim 20, wherein the enhanced scanning solutions module further comprises: ~~comprising:~~

- a detector subsystem;
- a sampling subsystem; and
- a software control subsystem coupled to said detector subsystem, and said sampling subsystem.

Claim 29 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module~~ of claim 28, wherein the enhanced scanning solutions module further comprising: ~~comprises:~~

- a dryer/moisture separator subsystem coupled to said software control subsystem.

Claim 30 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module~~ of claim 28, wherein said sampling subsystem of the enhanced scanning solutions module comprises at least one of:

- a sample loop;
- an absorbent trap; and
- a gas chromatography injection port.

Claim 31 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module of claim 28,~~ wherein the enhanced scanning solutions module further comprising comprises at least one of:

- an exhaust;
- a pneumatic supply;
- a power supply;
- a bypass module;
- a feedback signal; and
- a pressure control subsystem.

Claim 32 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module of claim 28,~~ wherein said enhanced scanning solutions module comprises on-the-fly reconfigurability, and further comprises:

- a plurality of operator-selectable modes.

Claim 33 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module of claim 28,~~ wherein said enhanced scanning solutions module further comprises:

- a plurality of pre-programmable operating modes that interactively reconfigures to perform any of a plurality of functions, subject to particular conditions.

Claim 34 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module~~ of claim 28, wherein said enhanced scanning solutions module further comprises:

an interface between said detector subsystem and a gas handling subsystem allowing insertion of at least one of: a sample, another detector, a flowpath, a flow path rate, a dryer, an exhaust, a feedback, and a trap.

Claim 35 (Currently Amended): The membrane interface probe apparatus ~~The enhanced scanning solutions module~~ of claim 28, wherein said software control subsystem of the enhanced scanning solutions module comprises at least one of:

- a data logger;
- a sequencer;
- a valve control system;
- a monitor;
- a display; and

a recording function.